# PRODUCTION WORK ORDER

**(Q.C./Proof Sign-Off Reverse Side)**

Submitted with Work ☑ Yes ☐ No  Advance Notice: ☑ Yes ☐ No

Submitted by: GRAHAM K.  Date: 6.22.87

Authorized by: _____  Project Code: AMKT

***WORK SPECIFICATIONS:***

Date of Presentation: 6-25-87  Final Copy Required: 1pm 6.24-87

- ☑ 35 mm Slides
- ☐ Questionnaire
- ☐ News Release
- ☐ Foils
- ☐ Repetitive Letters
- ☐ Newsletter
- ☐ Exhibits
- ☐ Business Cards
- ☐ Note Paper
- ☐ Cover Design
- ☐ Form: _____
- ☐ Other: 1 ORIGINAL TO C.GRAHAM.

No. Pages Submitted: Text: _____ Graphics: _____

If Incomplete, Date Remaining Copy to Be Submitted:

No. of Pages to Come: Text: _____ Graphics: _____

***PRINTING SPECIFICATIONS:***

No. Copies: _____ (paper) No. Copies _____ (slides)

- ☐ Photocopy
- ☐ Single Side
- ☐ Three-Hole Punch
- ☐ Print
- ☐ Double Side
- ☐ Velobind Punch
- ☐ Staple
- ☐ Binding: _____

Paper Color: _____ Type: _____

Ink Color: _____ Copyright ☐ Yes ☐ No

***OTHER SPECIFICATIONS:*** (Attachments, Mail/Ship Method, Etc.)

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***DELIVERY:*** To Printer/Slide Maker: _____

From Printer/Slide Maker: _____

Shipped or Delivered to: _____

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# QUALITY CONTROL/PROOFREADING SIGNOFF

DESCRIPTION: _____

PROJECT CODE: _____ DATE: _____

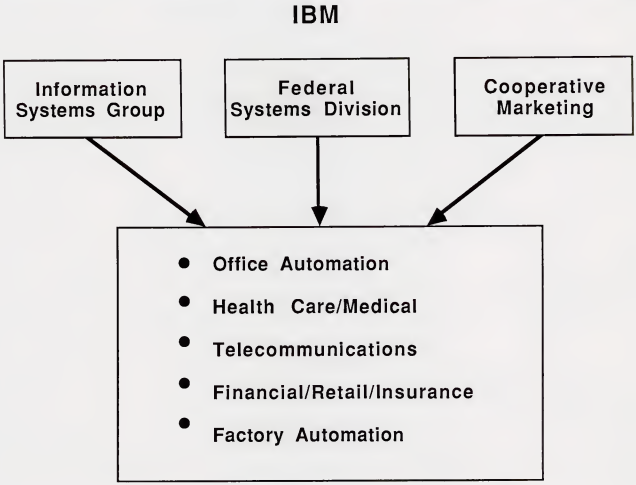
AUTHOR: _____

| TO BE PROOFED BY: | INITIAL | DATE |
|---|---|---|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| FINAL Q.C. | | |
| _____ | _____ | _____ |

☐ READY FOR PRINTER

## "POWER PLAYERS"

- IBM Federal Division/CSO
- Arthur Andersen
- EDS



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## THREE LEVELS OF PARTNERING OFFERED

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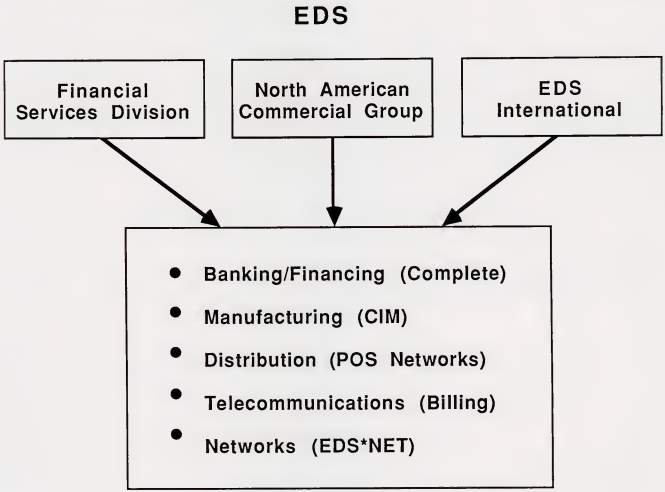
- "Commodity" (IBM Will //supply Hardware and Software Products)



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- Management Information Consulting Group with 4,500 Dedicated Staff* Focused on Specific Industries; $400M Revenues
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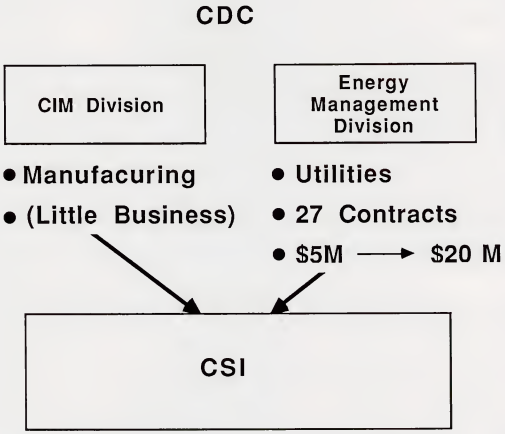

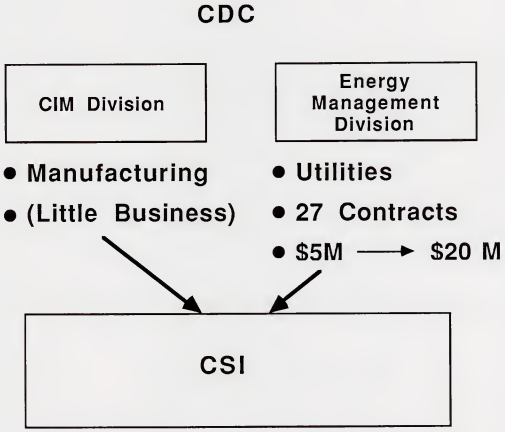

# 1986 CSI MARKET SHARES

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  - IBM - Banking, Insurance
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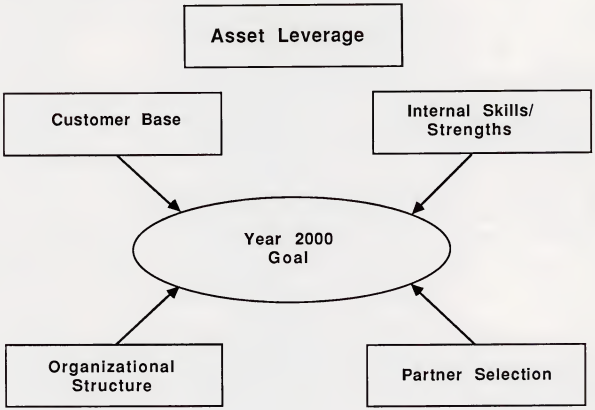

# COMMERCIAL SYSTEMS INTEGRATION

- Big Player Market
- Systems Solution Vendors (Technical Knowledge)
- Business Solution Vendors (Process Knowledge)
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* NO STANDARDS - (Only Implied Directions).

# SOFTWARE PRODUCTIVITY: THE THIRD PARTY ALTERNATIVE

Graham S. Kemp
Vice-President

INPUT

MQAD A.A. 5/87 37

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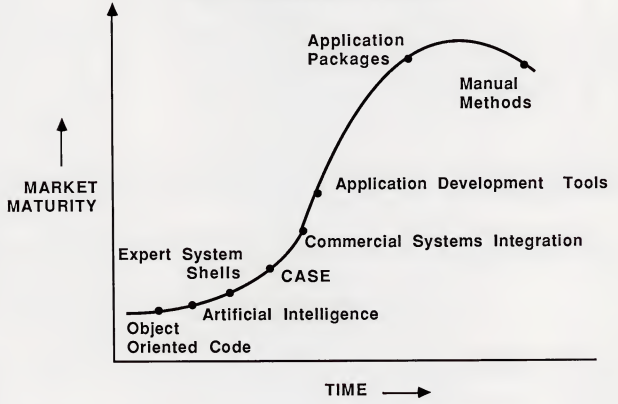

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# CONTENTS

# 1987 - 1997 MACRO ISSUES

## • End User Environment

- Emphasis on Integration of Systems Already in Place
- Performance, Productivity and Cost Reduction are Key Sales Points
- Networking, Connectivity and Upstream/Downstream Linkage Are the Growth Markets

# 1987 - 1997 MACRO ISSUES (Cont.)

- **Social Environment - Degradation in Quality and Dependability of Work Force**
  - Lack of Adequate Education and Training
  - Systems Needed to Support Stressed Upper Tier
  - Demand for Real-Time Information Support Systems

# 1987 - 1997 MACRO ISSUES (Cont.)

- **Productivity**
  - Movement of Productivity to POW
  - No Measurement Systems for IS Productivity
  - Despite All the Applications Development Tools, Backlog Is Constant
  - Wrong Targets, Measurements Targeted

# State of the Industry

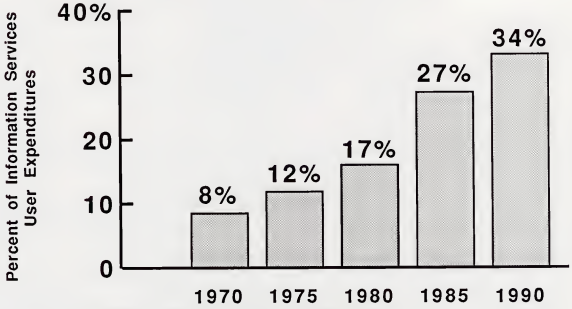
# SOFTWARE PRODUCT MARKETS

- Rate of Change is Accelerating
  - * Products
  - * Technology
  - * Market Strategy
  - * Vendor Complexion

# U.S. SOFTWARE PRODUCTS MARKET GROWTH

| 1986 Company Size | 1985/1986 Growth (%) |
|---|---|
| • Over $10M | 30 |
| • $1M to $10M | 26 |
| • Less Than $1M | 22 |
| Overall | 29 |

# U.S. SOFTWARE PRODUCTS SHARE OF INFORMATION SERVICES (1970 - 1990)




| | | | | | |
|---|---|---|---|---|---|
| Software Products | $0.3 | 0.7 | 2.9 | 13.3 | 34 |
| Total Information Services | $3.2 | 5.7 | 17.0 | 48.6 | 104 |

# Connectivity

INPUT®

# Departmental Systems

GSK520 11

# U.S. SOFTWARE PURCHASING DIRECTIONS

| | BEFORE | | TREND | |
|---|---|---|---|---|
| | System | Application | System | Application |
| Large Enterprises | ← IS Mgr. + Committees → | | IS Mgr. | Dept. Mgr. |
| Small Enterprises | ← Top Mgt → | | Top Mgt | User |

# DEPARTMENTAL SYSTEMS' CAPACITY TO EXPAND SIXFOLD

| TYPE | COMPUTING CAPACITY INDEX | | |
|---|---|---|---|
| | 1986 | 1991 | AAGR |
| Remote Mainframes | | | |
| Dumb Terminals | .25 | .60 | 19% |
| Micro Mainframes | | | |
| Dept. Mini or Supermicro | .25 | 1.50 | 43% |
| PC-Based LAN | | | |
| Standalone Micro | .50 | .90 | 12% |
| Total MIPS Index | 1.00 | 3.00 | 25% |

= Dept.Systems

# Where's the Productivity?

# APPLICATION DEVELOPMENT TOOLS TRENDS

- Higher Proportion of End User Developed Systems
- More Business-Driven Analysis
- Tool Integration Increasing
- AI Additives Becoming More Common

# DBMS MARKETS

- Shift from Hierarchical to Relational Structures Underway
- Functional Equivalency of Micro, Mini and Mainframe Versions of DBMS = Distributed Data Management
- Current Emphasis Is on Tools (e.g. 4GL, Screen Handlers, Forms Generators, etc.)

# IBM STANDARDS - CONTROLLING THE ENVIRONMENT

- **WINDOWS:** Common Menus, Icons
- **SQL:** User Query
- **SNA:** Intercompany Communication
- **Token Ring LAN:** Intra-Company Communications
- **OSI:** Network Design Normalization
- ***SAA:*** Application Design and User Interfaces: Bringing It All Together

# IBM's SYSTEMS APPLICATION ARCHITECTURE (SAA)

| | |
|---|---|
| * Common User Access: | Icons, Color, Graphics, Mouse |
| * Common Programming Interface: | SQL, QMF, Cobol, Fortran, C, etc. |
| * Common Communications Support: | 3270 Data Systems, SNA, Token Ring LAN, etc. |

# SOFTWARE ENGINEERING IMPERATIVES

- Address Productivity
- Minimize Cost
- Control Risk
- Manage Complexity
- Zero Defect
- Respond to Need for Integration

# WHO IS SELLING WHAT?

| VENDOR GROUP | THRUST | PROCESS UNDER-STANDING | FLEXIBILITY |
|---|---|---|---|
| Applications Sw | Standard Package | LTD | Low |
| Equipment Mfrs | Box | Variable | Medium |
| Professional Services | People | Variable | High |
| Systems Integrators | Solution | Medium | V. High |

# SOFTWARE PRODUCTIVITY ALTERNATIVES

| FACTOR | APPLICATION PACKAGES | ADT | CASE |
|---|---|---|---|
| Role | Fixed-Function Off-the-Shelf | Productivity | Automation/ Standards |
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# COMPUTER AIDED SOFTWARE ENGINEERING (CASE)

- Forces Disciplined Response to System Development
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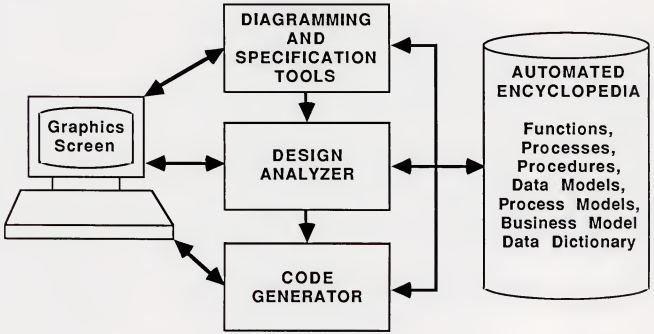

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# MULTIPLE DOMAIN SYSTEMS

- MULTIPLE DOMAIN SYSTEMS - Resolves Conflicts Between Expert System Domain Shells and "Learns" from the Process.
- OBJECT - ORIENTED CODE

## IN-HOUSE GROUPS: STILL IN CHARGE

- **Strength:** Knowledge of Historical, Political, and Operational Realities
- **Weaknesses:** Can't Rise Above Today's Problems to Visualize New Ways of Doing Things

# Systems Integration

# CSI PROJECT CHARACTERISTICS

- Multi-Year, Greater than $5M Value
- Substantial Customized Software, Networks
- Complex Multidisciplinary Information Systems Requirements
- Substantial Risk Exposure
- Teaming/Partnerships Required

# TYPICAL CSI TASKS

- "End to End" Project Management
- Process Feasibility/Trade-off Studies
- Systems Design

# TYPICAL CSI TASKS

- Selection/Configuration of Hardware/Software/Network
- Systems Integration/Implementation
- Training/Documentation
- Operations/Maintenance

# CSI DRIVING FORCES

- Integration
  - Data, Text, Voice, Image Processing/ Networking
- Competition
  - Foreign and Domestic Pressure in All Industries on Quality, Cost, Service, and Delivery
- Lack of In-House Skills, Time

# CSI DRIVING FORCES

- Strategic Significance
  - Account Control
  - Control of Downstream Spending in Multi-Year Contracts
- Partnerships Forming that May Last Ten Years; Once Formed May Be Difficult to Break/Compete With

# CSI MARKET CATEGORIES

| LEVEL | I | II |
|---|---|---|
| Integration | Systems | Processes |
| Skills Needed | Professional Services | Industry and Company Knowledge |
| Level of Risk | Low/ Medium | High |
| Account Control | Short-Term | Long-Term |

# 1986 CONTRACT EXAMPLES

| | | |
|---|---|---|
| IBM | Ford | $300M |
| | UA | $200M |
| AA | Insurance | $78M |
| | CIM | $69M |
| EDS | K Mart | $20M |
| AT&T | USC | $22M |

# PROJECT EXAMPLE

- Vendor and Value: EDS; $10 Million
- Project: Systems Development and Subsequent Operation of AIT Billing Systems
- Responsibilities: Design, Develop, Implement, and Operate

# PROJECT EXAMPLE

- **Vendor and Value: CSC; $12 Million**
- **Project: State of NJ Data Communications Network Linking 5 Offices and IBM/Honeywell/Prime/DEC Systems**
- **Responsibilities: System Integration and Support**

# NETWORK INTEGRATION - BEST OPPORTUNITY

- Large Scale Network Design, Integration, and Implementation Cross-Industry
- AT&T and RBOCs Unwilling to Lead
- Two-Thirds of CSI Projects Will Have Network Integration

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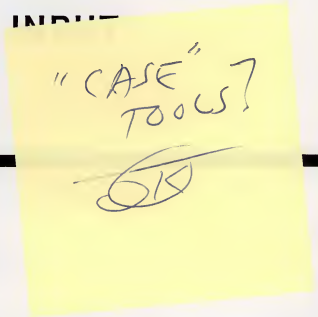


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## APPLICATIONS SOFTWARE OUTLOOK

- Big Player Market
- Life-Cycle Contraction
- Professional Services Thrust
- Opportunities
  - Artificial Intelligence
  - Productivity Tools
  - Niche Markets

## RECOMMENDATIONS

- Maximize Corporate Information Assets
- Track and Integrate Emerging Technology Early
- Evaluate Underlying System Architecture Assumption
- Emphasize Integration, Performance and Service

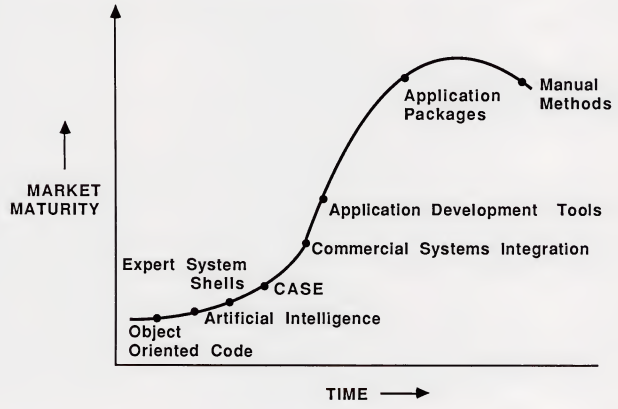
## RECOMMENDATIONS

- Departmental Systems Are a Major Corporate Value
- Key to Success
  - Aggressive Departmental Systems Strategy
  - Well-Defined Responsibilities
  - Performance/Productivity Emphasis

# RECOMMENDED CHANGES OF DIRECTION

- Data Processing → Information Flow
- Information Quantity → Information Quality
- Automation of Process → Improvement of Process
- Tool and Application Builders → D/I/K Architects
- Product and Systems Vendors → Productivity Consultants

# SOFTWARE DEVELOPMENT ALTERNATIVES



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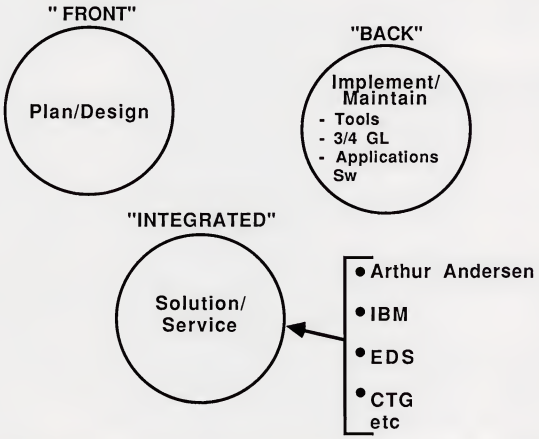

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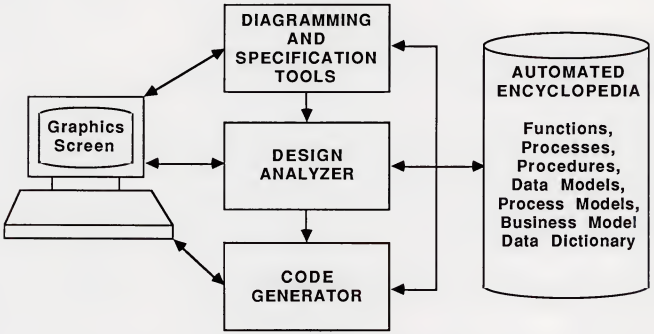

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- Higher Proportion of End User Developed Systems
- More Business-Driven Analysis
- Tool Integration Increasing
- AI Additives Becoming More Common

# CSI VERSUS FSI

| Characteristics | CSI | FSI |
|---|---|---|
| Risk Exposure | High | Contained |
| Customer | Multiple Contacts | Few Contacts |
| Project Scope | Broad | Focused |
| Vendor | General | Specialized |
| Bid | Fixed Price | Cost Plus/Fixed Price/ Bonuses |

# HARDWARE MANUFACTURERS

- Goals:
  - Control of "Cornerstone" Projects
  - Defense of Accounts
  - Competitive Penetration
  - Revenue Growth

# MANAGEMENT CONSULTANTS

- Goal: Conceptual Guidance, Partnerships
- Strength: Good Image, Leverageable Base
- Weakness: Inability to Implement
- Strategy: Not Apparent
- Leaders: McKinsey, Booz-Allen, ADL

# PROFESSIONAL SERVICES VENDORS

- Goal: Best Available Market Opportunity
- Strength: Project Management Know-How, Independence
- Weakness: Industry Expertise, Weak Marketing/Sales

# ENGINEERING & CONSTRUCTION VENDORS

- Goal: Regain Control Over Large Percent of Their Contracts
- Strength: Complex Project Management and Systems Integration
- Weakness: Narrowly Focused, Weak Marketing/Sales

# AEROSPACE DIVISIONS

- Goal:
  - Develop a Viable, Profitable Commercial Equivalent to Federal Contracts
- Strengths:
  - Advanced Technical Expertise
  - Project Management
  - Good Image

# COMMUNICATIONS VENDORS

- Goal:
  - Diversification, Network Project Management
- Strengths:
  - Image
  - Network Skills
  - Telecommunications Engineering Knowledge

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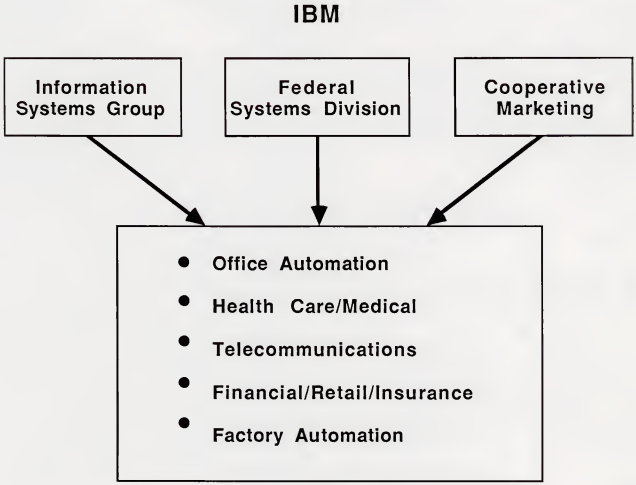

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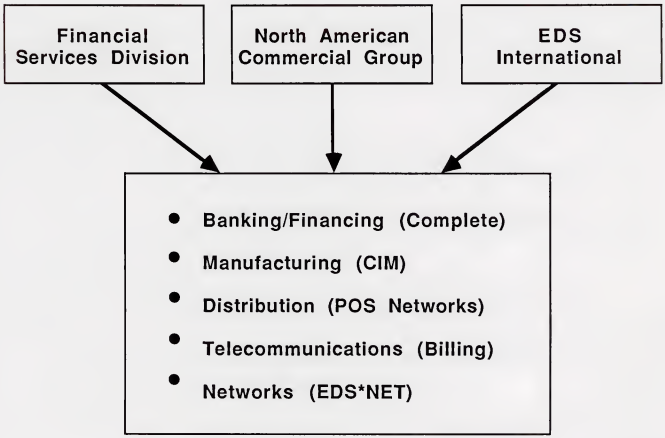

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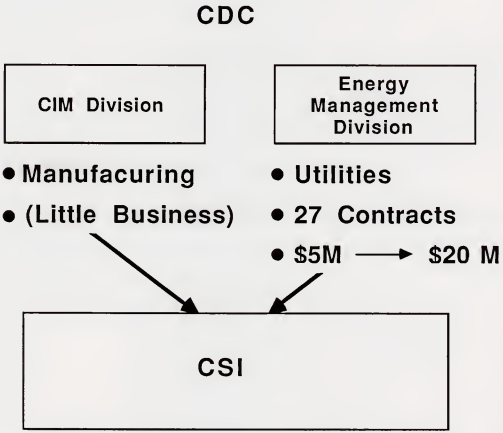
## BECHTEL

- Already Strongly Focused on:
  - Industrial Automation (Bechtel National)
  - Instrumentation/Process Control (Energy and Utilities)
  - Telecommunications Engineering (Optical Fiber, Microwave)



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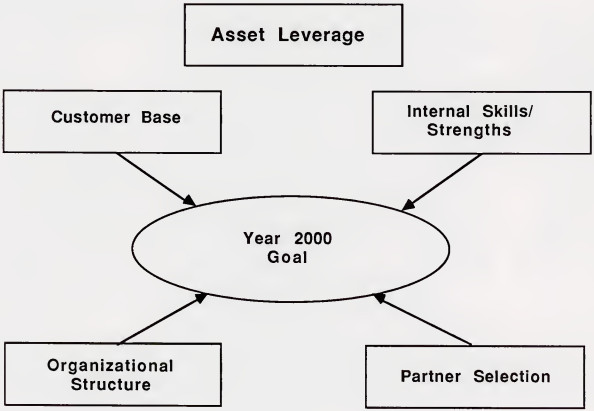

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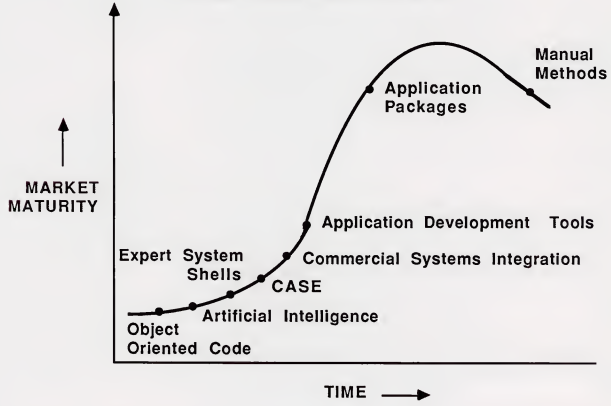

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- Tool and Application Builders → D/I/K/ Architects
- Product and Systems Vendors → Productivity Consultants

# SOFTWARE PRODUCTIVITY: THE THIRD PARTY ALTERNATIVE

Graham S. Kemp
Vice-President

INPUT

# U.S. SOFTWARE PURCHASING DIRECTIONS

| | BEFORE | | TREND | |
|---|---|---|---|---|
| | System | Application | System | Application |
| Large Enterprises | ← IS Mgr. + Committees → | | IS Mgr. | Dept. Mgr. |
| Small Enterprises | ← Top Mgt → | | Top Mgt | User |

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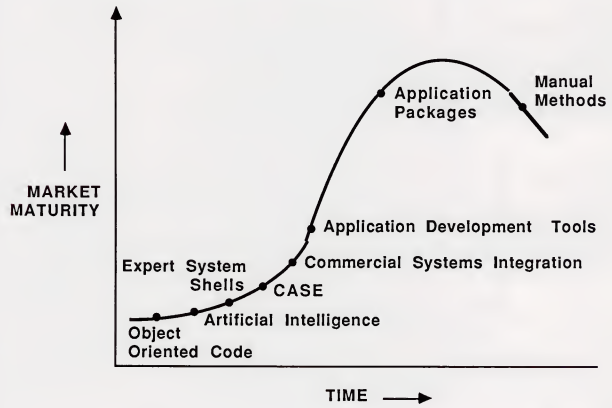
# SOFTWARE DEVELOPMENT ALTERNATIVES



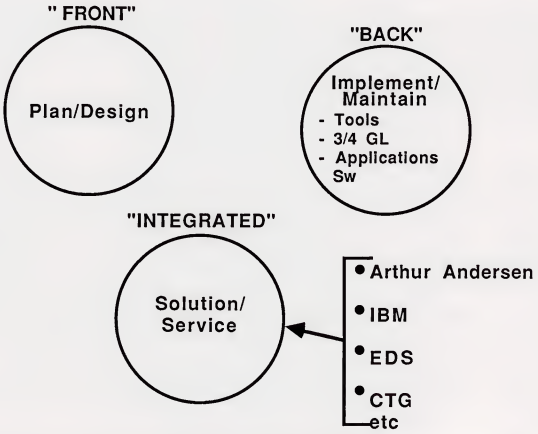
# WHO IS SELLING WHAT?

| VENDOR GROUP | THRUST | PROCESS UNDER-STANDING | FLEXIBILITY |
|---|---|---|---|
| Applications Sw | Standard Package | LTD | Low |
| Equipment Mfrs | Box | Variable | Medium |
| Professional Services | People | Variable | High |
| Systems Integrators | Solution | Medium | V. High |

# SOFTWARE PRODUCTIVITY ALTERNATIVES

| FACTOR | APPLICATION PACKAGES | ADT | CASE |
|---|---|---|---|
| Role | Fixed-Function Off-the-Shelf | Productivity | Automation/ Standards |
| Customization | Limited | High | High |
| Integration | High | Moderate | High |
| Performance | Moderate | Moderate | ? |

# YOUNG, FRAGMENTED SUPPLIER MARKET



# COMPUTER AIDED SOFTWARE ENGINEERING (CASE)

- Forces Disciplined Response to System Deverlopment
- Interactive, Graphic Design, Development Testing
- Tools & Process for the Entire Software System Lifecycle
- Suports COBOL, PL/I,C, ADA

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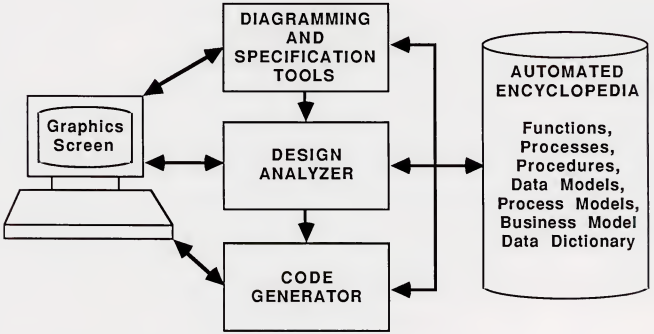
# CASE CHARACTERISTICS






GSK520-25 (Rd)

# CASE TRENDS

- DESIGN AUTOMATION - Graphic Systems Specification to Automatic Code Generation.
- INTELLIGENT WORKSTATIONS - Generally PC Based with Simplified Informative Commands.
- EXPERT SYSTEMS SHELLS - Single Domain of Expertise.
- NO STANDARDS - (Only Implied Directions).

# MULTIPLE DOMAIN SYSTEMS

- MULTIPLE DOMAIN SYSTEMS - Resolves Conflicts Between Expert System Domain Shells and "Learns" from the Process.
- OBJECT - ORIENTED CODE

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# COMMERCIAL SYSTEMS INTEGRATION

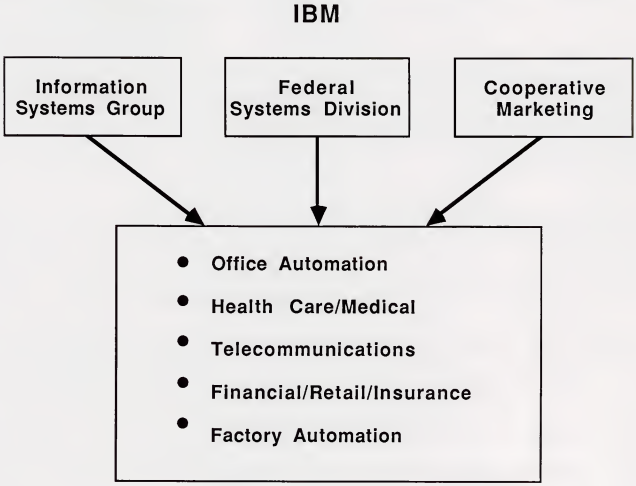
- Big Player Market
- Systems Solution Vendors (Technical Knowledge)
- Business Solution Vendors (Process Knowledge)
- Strategic Competitive Advantage Systems

## IN-HOUSE GROUPS: STILL IN CHARGE

- **Strength:** Knowledge of Historical, Political, and Operational Realities
- **Weaknesses:** Can't Rise Above Today's Problems to Visualize New Ways of Doing Things

# "POWER PLAYERS"

- IBM Federal Division/CSO
- Arthur Andersen
- EDS

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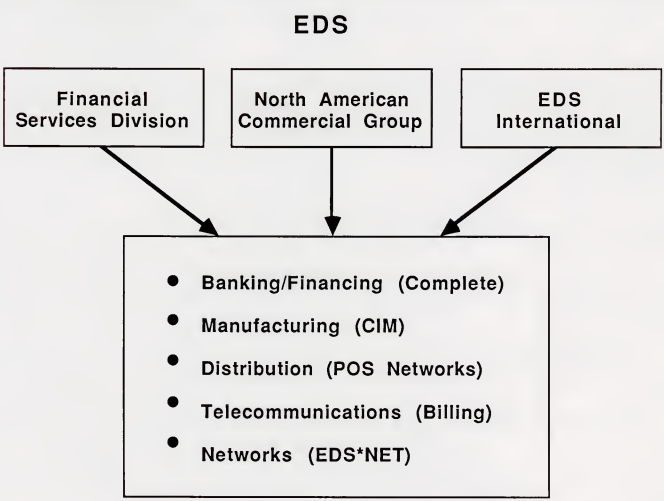
3SK520-03 (Rd)

## IBM

## THREE LEVELS OF PARTNERING OFFERED

- "Prime" (IBM Lead Vendor)
- "Secondary" (Another Vendor is Prime)
- "Commodity" (IBM Will //supply Hardware and Software Products)



## ARTHUR ANDERSEN

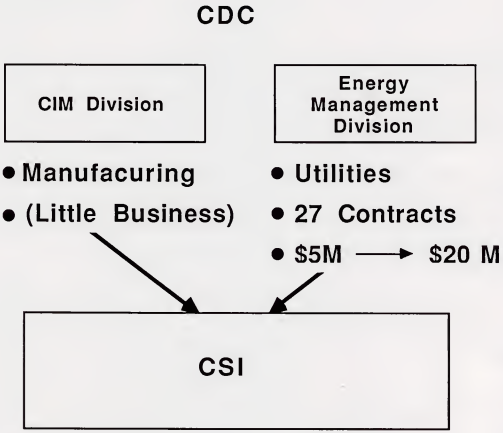
- Management Information Consulting Group with 4,500 Dedicated Staff* Focused on Specific Industries; $400M Revenues
  - *Manufacturing (CIM)
  - Aerospace
  - Insurance
  - *Networking
  - Others (e.g., Food and Beverage)

## AT & T

- Unique Opportunity to Become Prime Supplier of Network Integration to Corporate America
- No Focus on CSI
- Has Bid 17 Contracts in Partnership with EDS
- Should Forget Minicomputers and Concentrate on Network Integration

## BECHTEL

- Already Strongly Focused on:
  - Industrial Automation (Bechtel National)
  - Instrumentation/Process Control (Energy and Utilities)
  - Telecommunications Engineering (Optical Fiber, Microwave)

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# 1986 CSI MARKET SHARES

| RANK | VENDOR | $ MILLIONS | PERCENT MARKET |
|---|---|---|---|
| 1 | IBM | $470 | 28% |
| 2 | Arthur Andersen | 220 | 13% |
| 3 | EDS | 120 | 7% |
| 4 | AT &T | 55 | 3% |
| 5 | CDC | 50 | 3% |

## CSI TRENDS

- Development of Industry Sector-Specific, Complex Project Expertise/Image:
  - IBM - Banking, Insurance
  - Arthur Andersen - Manufacturing, Networks
  - EDS - Manufacturing, Distribution, Networks

## MANAGE RISK CONTAINMENT

- Size of Risk Varies with Project Size, Complexity
- All Levels of Company Need to be Sensitized to Risk Management
- Marketable

# CONCLUSIONS

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## APPLICATIONS SOFTWARE OUTLOOK

- Big Player Market
- Life-Cycle Contraction
- Professional Services Thrust
- Opportunities
  - Artificial Intelligence
  - Productivity Tools
  - Niche Markets

## RECOMMENDATIONS

- Maximize Corporate Information Assets
- Track and Integrate Emerging Technology Early
- Evaluate Underlying System Architecture Assumption
- Emphasize Integration, Performance and Service

## RECOMMENDATIONS

- Departmental Systems Are a Major Corporate Value
- Key to Success
  - Aggressive Departmental Systems Strategy
  - Well-Defined Responsibilities
  - Performance/Productivity Emphasis

# RECOMMENDED CHANGES OF DIRECTION

- Data Processing → Information Flow
- Information Quantity → Information Quality
- Automation of Process → Improvement of Process
- Tool and Application Builders → D/I/K Architects
- Product and Systems Vendors → Productivity Consultants

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# DEFINE STRATEGIC GOAL NOW